KEMX-6000

Industrial Motherboard in Mini-ITX form factor with 2nd generation Intel® Core™ i7/i5 Processors and QM67 Express Chipset

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Quanmax reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology. Changes which affect the operation of the unit will be documented in the next revision of this user's guide.

Revision	Date	Edited by	Changes
1.0	2011/03/25	Zack	Initial Release

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Safety Instructions

■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

WARNING

High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this user’s guide. Follow installation and troubleshooting instructions closely.

■ Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.
You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component’s antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- When transporting a sensitive component, first place it in an antistatic container

or packaging.

- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

Preface

■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

NOTE

Driver downloads and additional information are available under Downloads on our web site: www.quanmax.com.

■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to “Warranty Policy” for the return procedure.

■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

FCC Compliance Statement for Class A Devices

The product(s) described in this user’s guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user’s guide, may cause harmful interference to radio communications. Operation of this equipment in a residential

area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.
Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

■ Warranty Policy

Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at www.quanmax.com. Please consult your distributor for warranty verification.
The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.
No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Limited Warranty return, please contact Support at www.quanmax.com and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to support@quanmax.com to apply for one.
All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the

date of purchase.
To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.
Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

Limitation of Liability

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

■ Maintaining Your Computer

Environmental Factors

- **Temperature**

  The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.
  If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

- **Humidity**

  High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such

properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

- **Altitude**

  Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

- **Surge Protector**

  Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

- **Line Conditioner**

  Line conditioners go beyond the over voltage protection of surge protectors. Line conditioners keep a system’s AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

- **Uninterruptible Power Supply**

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.
UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive unit s allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

■ Overview

The KEMX-6000 is a Mini-ITX form factor industrial motherboard combining the latest 2nd generation Intel® Core™ i7/i5 processors with the high integration of the Intel® QM67 chipset. Featured are DDR3 1066/1333 SO-DIMM up to 8GB, 24-bit LVDS, HDMI, DVI-D, VGA, 2x Gigabit Ethernet, 5x SATA, 1x PCIE x 16, mini PCIe Expansion slot, 2x USB 3.0, 8x USB 2.0, 6x COM ports with Power Selection, HD audio, keyboard/mouse and CompactFlash.
The KEMX-6000 is a compact, high performance industrial motherboard that is ideal for a variety of applications.

Checklist

- Driver/ Manual CD
- Quick Installation Guide
- I/O Shield
- KEMX-6000 Mini-ITX main board
- SATA cable (7-pin connector with lock, L=46cm)
- Y-Cable

Features

- 2nd Generation Intel® Core™ i7/i5 Processors
- Intel® QM67 Express Chipset
- Supports 1x VGA, 1x DVI-D, 1x HDMI, and 2x 24-bit dual-channel LVDS
- Two Dual Channel DDR3 SO-DIMM Socket, total up to 8 GB
- 1x PCIe x16 slot, 2x Mini PCIe slot, 1x Compact Flash Socket
- 5x SATA, 2x USB 3.0, 8x USB 2.0, 6 x COM Ports
- 2x GbE, iAMT 7.0 supported
- Watchdog Timer, Hardware Monitor

■ Product Specifications

Model Name	KEMX-6000
CPU Support	2nd Generation Intel® Core™ i7/i5 Processors
Chipset	Intel® QM67 Express Chipset
Memory	2x DDR3 1066/1333 SO-DIMM Socket, up to 8GB (non-ECC)
BIOS	AMI PnP Flash BIOS iAMT7.0 supported
Display	Sandy Bridge Integrated graphics core. Display from Cougar Point One DB-15 connector on rear I/O One DVI-D connector on rear I/O One HDMI connector on rear I/O Two pitch 1.0mm 30-pins SPWG connectors for two 24-bits LVDS supported LVDS backlight control supported
LAN	Two Gigabit Ethernet ports supported One GbE controller (Intel LAN 82574) onboard One GbE PHY (Intel 82579) onboard Two RJ-45 connectors with Gb Transformer (stack with dual USB connectors) on rear I/O
Audio	Realtek ALC888 HD audio codec onboard. One audio stack connector for Line-Out, Line-In and Mic-In on rear One S/PDIF connector on rear I/O for S/PDIF out supported One 2x5-pins pitch 2.54mm headers for front panel audio supported One 2Watts audio amplifier onboard Two pitch 2.0mm wafer connectors for Right/Left speaker out
Peripheral Support	Storage supported Four 7-pins SATA connectors supported Raid 0/1/5/10 supported One CF socket supported Two USB3.0 ports support Two ports stack with two RJ-45 connectors on rear I/O Eight USB2.0 ports support Two ports stack with two RJ-45 connectors on rear I/O Six ports via four 2x5-pins 2.54mm pitch headers for internal.

	One 2x5-pins 2.54mm pitch header for 8-bits DIO supported 4-bits Input and 4-bits Output One 6-pin pitch 2.0mm wafer connector for PS/2 Keyboard/Mouse Six COM ports supported Two DB-9 male connectors for COM1, COM2 on rear I/O COM1 & COM2 with RS-232/422/485 supported Four 2x5-pins pitch 2.54mm headers for COM3 ~ COM6 COM3 & COM4 with +12V & +5V supported, select by jumper COM5 & COM6 with RS-232 only One 1x5-pins pitch 2.54mm header for IrDA supported Buzzer onboard TPM1.2 supported Two fans supported One 3-pin FAN for CPU One 3-pin FAN for system Fans speed control supported
Power	One 24-pins standard ATX power connector for power input One 4-pins ATX power connector for CPU core power +12V & GND input AT/ATX supported
Battery	One vertical battery socket onboard Lithium, 3V
ACPI	ACPI supported
Expansion	Two Mini PCIE slots supported Support MiniPCIE SPEC. version1.2 only. One 1x6-pins pitch 1.25mm wafer connector for 2G/3G SIM card module supported One PCIEx16 slot supported
Watchdog Timer	1-255 step
Hardware Monitor	Supply voltages detection CPU and system temperature detection CPU and system fan speed detection
Dimensions	Mini-ITX (170 x 170 mm)
Environmental Factors	Operation Temp: 0ºC - 60ºC Storage Temp.: -10ºC - 85ºC Humidity: 0% - 90%
Certifications	CE, FCC Class A

Table 1 KEMX-6000 Specification

■ System Block Diagram

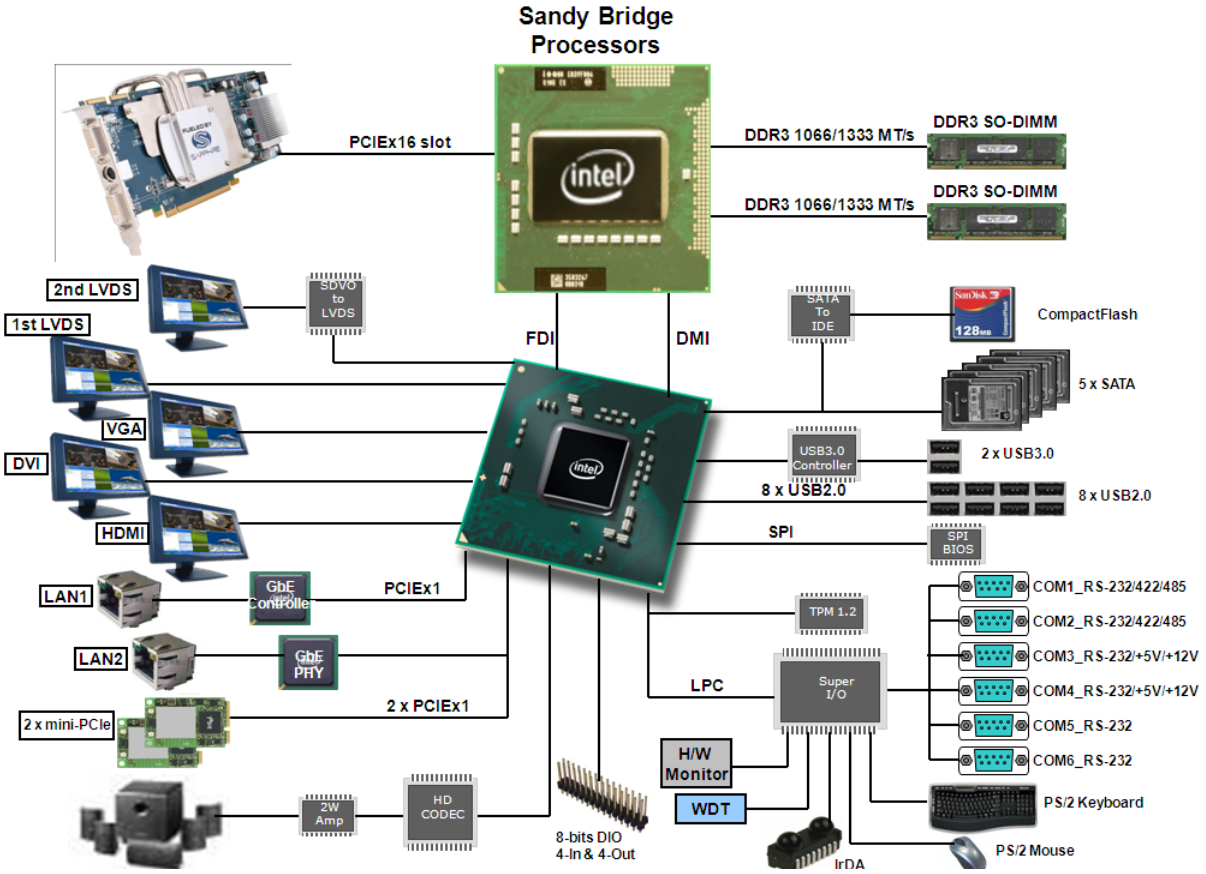


Figure 1 Block Diagram

■ Mechanical Dimensions

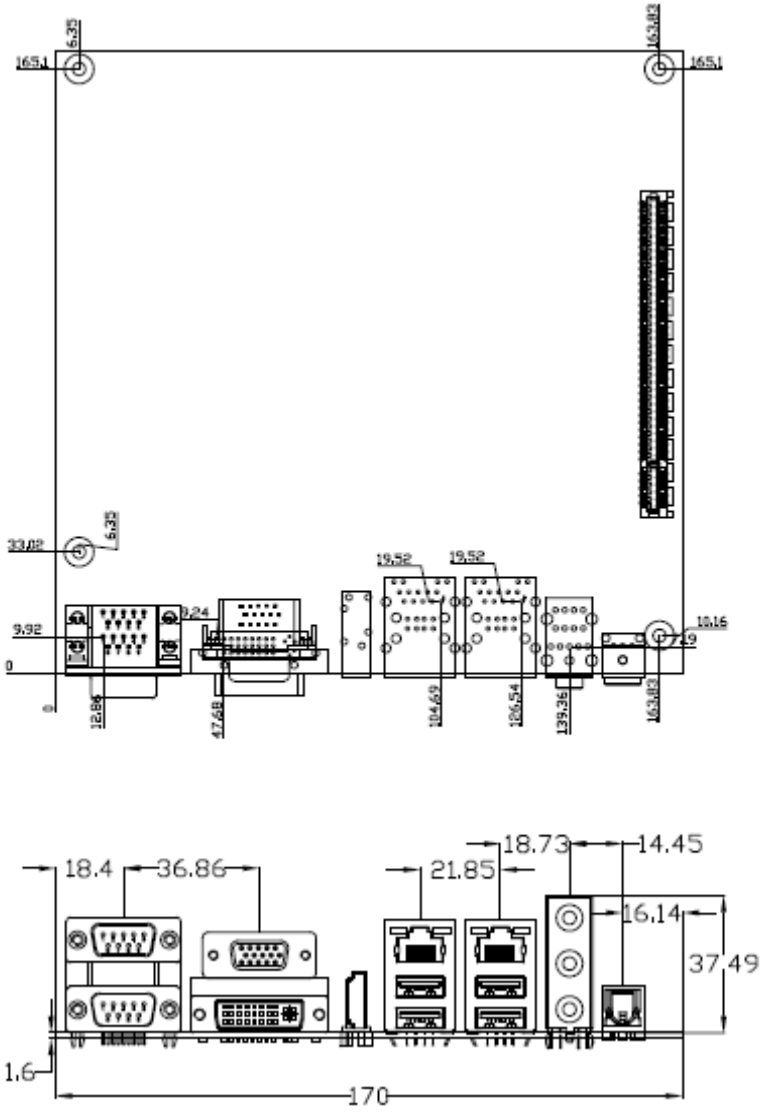


Figure 2 Mechanical Dimensions

Chapter 2

Hardware Settings

■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

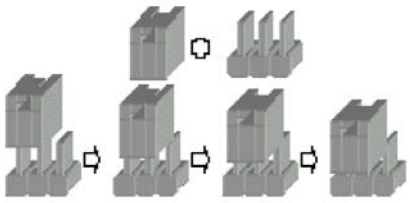


Figure 3 Jumper Connector

For a three-pin jumper (see *Figure 3*), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.
To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

■ Jumper Settings and Pin Definitions

For jumper and connector location, please refer to the diagrams below.

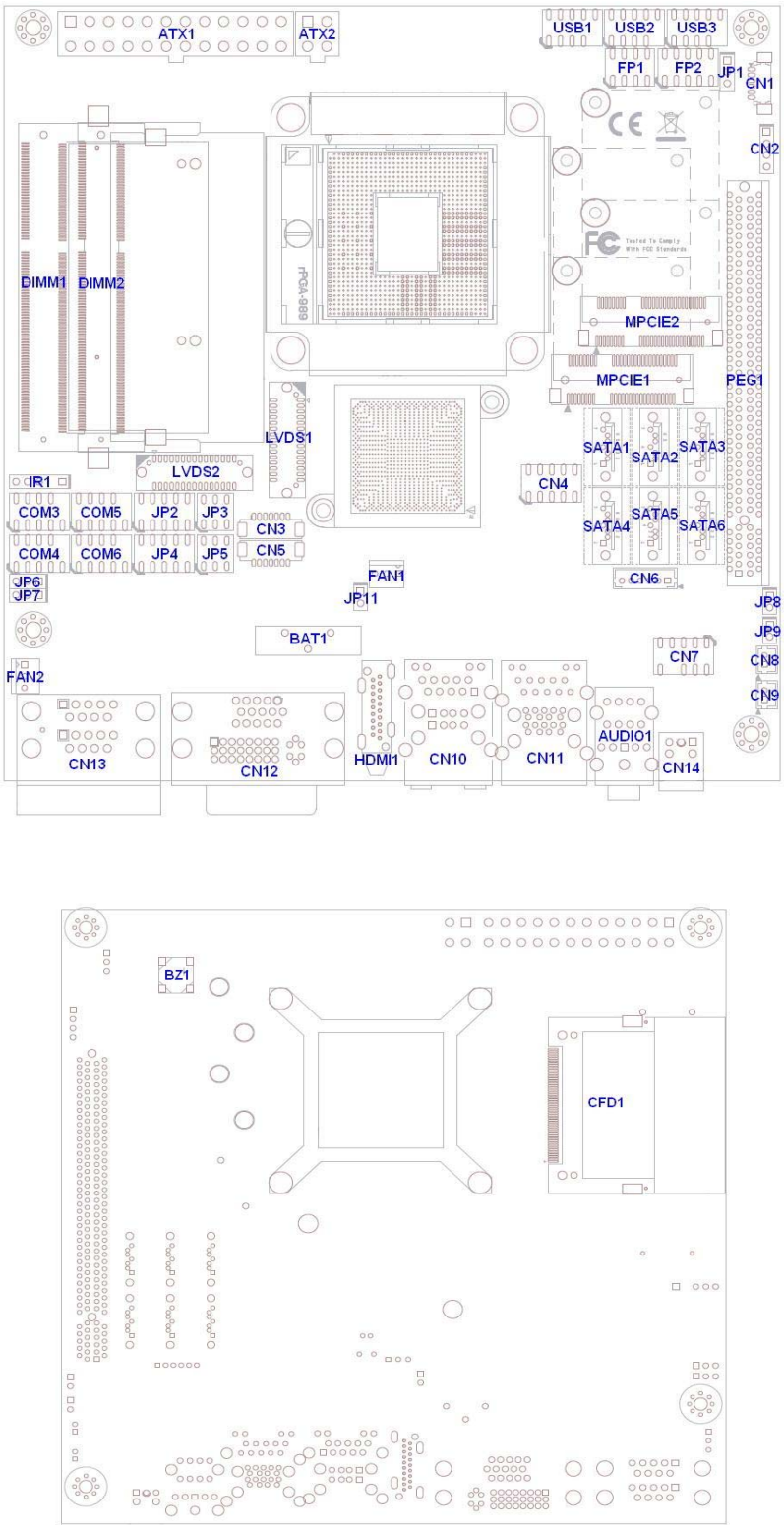


Figure 4 Jumper and Connector Locations

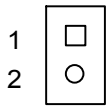
Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 2 Jumper List

Label	Function
JP1	*AT / ATX Mode Selection*
JP2	*Signal / Power Selection for COM5*
JP3	*Panel & Backlight Power Selection for LVDS2*
JP4	*Signal / Power Selection for COM6*
JP5	*Panel & Backlight Power Selection for LVDS1*
JP6	*Backlight Power Enable Selection for LVDS1*
JP7	*Backlight Power Enable Selection for LVDS2*
JP8	*RTC Reset Selection*
JP9	*SRTC Reset Selection*
JP11	*Flash Description Security Over-ride*

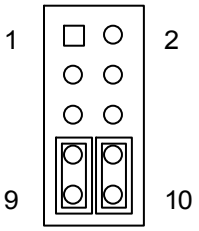
Table 3 JP1 AT / ATX Mode Selection



Jumper	Status
1-2 Open	ATX Mode
1-2 Short	AT Mode

Pitch: 2.54mm [YIMTEX 3321*02SAGR (6T)]

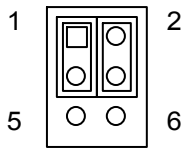
Table 4 JP2 Signal / Power Selection for COM5



Jumper	Setting	Function
1	1-3 Short	Pin 1 = +12V
	3-5 Short	Pin 1 = +5V
	5-7 Short	Pin 1 = +5V
	7-9 Short	Pin 1 = DCD
2	2-4 Short	Pin 9 = +12V
	4-6 Short	Pin 9 = +5V
	6-8 Short	Pin 9 = +5V
	8-10 Short	Pin 9 = RI

Pitch: 2.54mm [YIMTEX 3362*05SANGR]

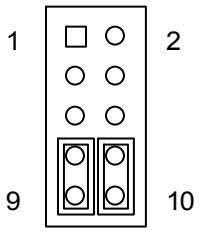
Table 5 JP3 Panel Backlight Power Selection for LVDS2



Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V

Pitch: 2.54mm [YIMTEX 3362*03SAGR]

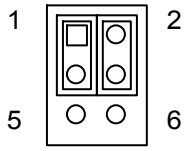
Table 6 JP4 Signal / Power Selection for COM6



Jumper	Setting	Function
1	1-3 Short	Pin 1 = +12V
	3-5 Short	Pin 1 = +5V
	5-7 Short	Pin 1 = +5V
	7-9 Short	Pin 1 = DCD
2	2-4 Short	Pin 9 = +12V
	4-6 Short	Pin 9 = +5V
	6-8 Short	Pin 9 = +5V
	8-10 Short	Pin 9 = RI

Pitch: 2.54mm [YIMTEX 3362*05SANGR]

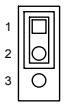
Table 7 JP5 Panel Backlight Power Selection for LVDS1



Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V

Pitch: 2.54mm [YIMTEX 3362*03SAGR]

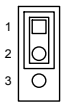
Table 8 JP6 Backlight Power Enable Selection for LVDS1



Jumper	Status
1-2	Active High
2-3	Active Low

Pitch: 2.54mm [YIMTEX 3321*03SAGR (6T)]

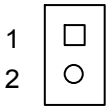
Table 9 JP7 Backlight Power Enable Selection for LVDS2



Jumper	Status
1-2	Active High
2-3	Active Low

Pitch: 2.54mm [YIMTEX 3321*03SAGR (6T)]

Table 10 JP8 RTC Reset Selection

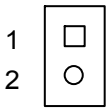


Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear RTC CMOS

Pitch: 2.54mm [YIMTEX 3321*02SAGR (6T)]

Remark: You must go to **BIOS EXIT menu to do "**Load Optimal Defaults" after clear CMOS.

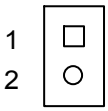
Table 11 JP9 SRTC Reset Selection



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear ME Registers

Pitch: 2.54mm [YIMTEX 3321*02SAGR (6T)]

Table 12 JP11 Flash Description Security Over-ride



Jumper	Status
1-2	Disable
2-3	Enable

Pitch: 2.54mm [YIMTEX 3321*03SAGR (6T)]

(For Quanmax Debug Only)

Rear Panel Pin Assignments

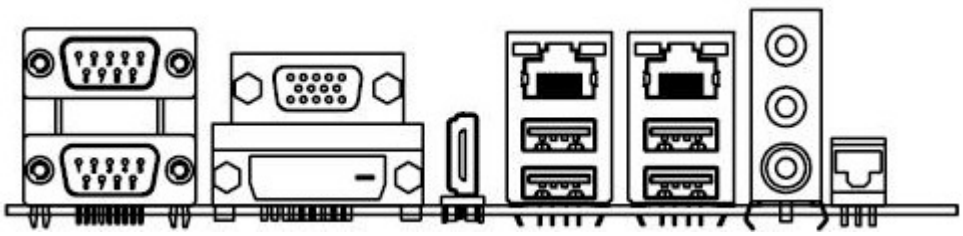
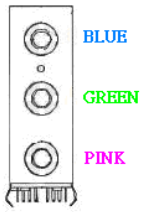


Figure 5 Rear Panel IO

Table 13 Rear Panel Connector List

Label	Function
AUDIO1	*3 Stack-up Azalia Audio Phone Jack*
CN10	*LAN1 & USB2.0 Port 0,1 Connector*
CN11	*LAN2 & USB2.0 Port 2,3 Connector*
CN12	*CRT DB-15 & DVI-D Connector*
CN13	*RS-232 / 422 / 485 Port 1, 2 Connector*
CN14	*Optical S/PDIF Output Connector*
HDMI1	*HDMI Connector*

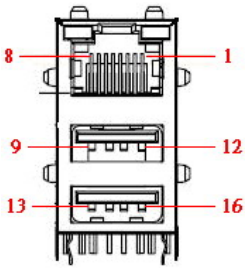
Table 14 AUDIO1 3 Stack-up Azalia Audio Phone Jack



	Signal Name
BLUE	LINE IN
GREEN	LINE OUT
PINK	MIC IN

[Foxconn JA33331-H11P-4F]

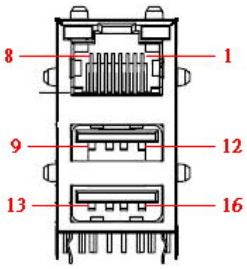
Table 15 CN10 LAN1 & USB2.0 Port 0, 1 Connector



Pin	Signal	Pin	Signal
1	MDI[0]+	9	+USBVCC
2	MDI[0]-	10	USB_A-
3	MDI[1]+	11	USB_A+
4	MDI[1]-	12	GND
5	MDI[2]+	13	+USBVCC
6	MDI[2]-	14	USB_B-
7	MDI[3]+	15	USB_B+
8	MDI[3]-	16	GND

[UDE RU1-161F9WGF (XB)]

Table 16 CN11 LAN2 & USB2.0 Port 2,3 Connector



Pin	Signal	Pin	Signal
1	MDI[0]+	9	+USBVCC
2	MDI[0]-	10	USB_A-
3	MDI[1]+	11	USB_A+
4	MDI[1]-	12	GND
5	MDI[2]+	13	+USBVCC
6	MDI[2]-	14	USB_B-
7	MDI[3]+	15	USB_B+
8	MDI[3]-	16	GND

[UDE RU1-161F9WGF (XB)]

Note：LAN LED Configuration

1. Left (Link) LED：Green / Orange

   Link 1000 ➔ Orange LED on

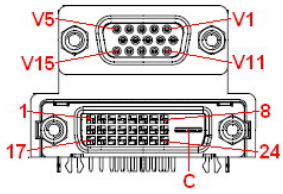
   Link 100 ➔ Green LED on

   Link 10 or No Link ➔ LED off

2. Right (Active) LED：Yellow

   Activity ➔ Yellow LED blink

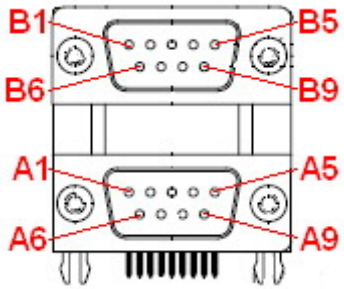
Table 17 CN12 CRT DB-15 & DVI-D Connector



Signal Name	Pin	Pin	Signal Name
Red	V1	V2	Green
Blue	V3	V4	NC
GND	V5	V6	GND
GND	V7	V8	GND
+5V	V9	V10	GND
NC	V11	V12	DDC_DATA
HSYNC	V13	V14	VSYNC
DDC_CLK	V15		
Signal Name	Pin	Pin	Signal Name
TX2-	1	2	TX2+
GND	3	4	NC
NC	5	6	DDC_CLK
DDC_DATA	7	8	NC
TX1-	9	10	TX1+
GND	11	12	NC
NC	13	14	+5V
GND	15	16	HTPLG
TX0-	17	18	TX0+
GND	19	20	NC
NC	21	22	GND
TXC+	23	24	TXC-
GND	C		

[FAN YING G205D2C01012PHN]

Table 18 CN13 RS-232 / 422 / 485 Port 1, 2 Connector



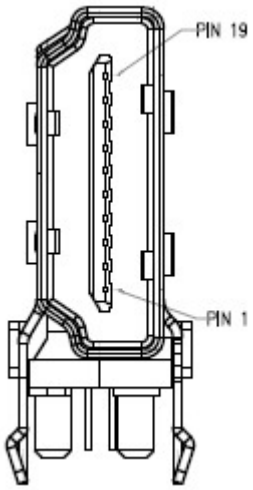
Port	Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	B1	DCD	TX-	DATA-	TX-
	B2	RXD	RX+	NA	RX+
	B3	TXD	TX+	DATA+	TX+
	B4	DTR	RX-	NA	RX-
	B5	GND	GND	GND	GND
	B6	DSR	NA	NA	NA
	B7	RTS	NA	NA	NA
	B8	CTS	NA	NA	NA
	B9	RI	NA	NA	NA
Port	Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
2	A1	DCD	TX-	DATA-	TX-
	A2	RXD	RX+	NA	RX+
	A3	TXD	TX+	DATA+	TX+
	A4	DTR	RX-	NA	RX-
	A5	GND	GND	GND	GND
	A6	DSR	NA	NA	NA
	A7	RTS	NA	NA	NA
	A8	CTS	NA	NA	NA
	A9	RI	NA	NA	NA

[FAN YING D20HB1102112PN]

Note：RS-232 / 422 / 485 can be selected in BIOS setup.

Table 19 CN14 Optical S/PDIF Output Connector
[FOXCONN 2F11TC1-EM90-4F]

Table 19 HDMI Connector

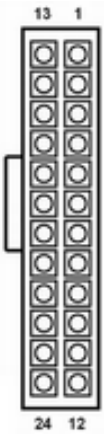


Pin	Signal
1	TMDS Data2+
2	Ground
3	TMDS Data2–
4	TMDS Data1+
5	Ground
6	TMDS Data1–
7	TMDS Data0+
8	Ground
9	TMDS Data0–
10	TMDS Clock+
11	Ground
12	TMDS Clock–
13	Reserved
14	Reserved
15	DDC_CLK
16	DDC_DATA
17	Ground
18	+5 V Power
19	Hot Plug Detect

[ARGOSY HDMIV-A1915-DK2R]

Main Board Pin Assignments

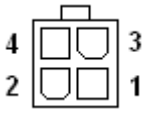
Table 20 ATX1 24-pin ATX Power Input Connector



Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	NC
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	POWER OK	20	NC
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

Pitch: 4.2mm [YIMTEX 576MWA2*12STR]

Table 21 ATX 4-pin ATX Power Input Connector

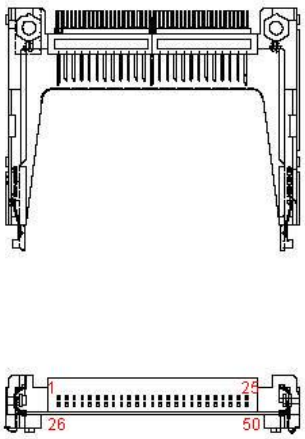


Pin	Signal Name
1	GND
2	GND
3	+12V
4	+12V

Pitch: 4.2mm [YIMTEX 576MWA2*02STR]

Table 22 BAT1 CR2032 Battery Holder
[LOTES AAA-BAT-038-K01]

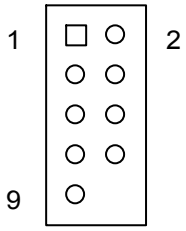
Table 23 CFD1 CF Type II Connector



Signal Name	Pin	Pin	Signal Name
GND	1	26	GND
IDE Data 3	2	27	IDE Data 11
IDE Data 4	3	28	IDE Data 12
IDE Data 5	4	29	IDE Data 13
IDE Data 6	5	30	IDE Data 14
IDE Data 7	6	31	IDE Data 15
IDE Chip select 1#	7	32	IDE Chip select 3#
GND	8	33	GND
GND	9	34	IDEIOR#
GND	10	35	IDEIOW#
GND	11	36	+5V
GND	12	37	IDEIRQ
+5V	13	38	+5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	Reset IDE
GND	17	42	IDEIORDY
SDA2	18	43	DREQ
IDE Address 1	19	44	DACK#
IDE Address 0	20	45	IDE activity
IDE Data 0	21	46	PDIAG#
IDE Data 1	22	47	IDE Data 8
IDE Data 2	23	48	IDE Data 9
IOIS16#	24	49	IDE Data 10
GND	25	50	GND

[SUNLIT 60303020]

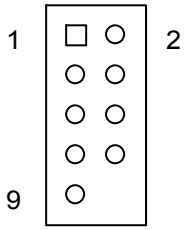
Table 24 COM3 RS-232 Port 3 Pin Header



Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	NC, Key

Pitch: 2.54mm [YIMTEX 3362*05SANGR-10]

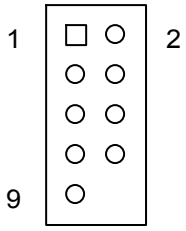
Table 25 COM4 RS-232 Port 4 Pin Header



Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	NC, Key

Pitch: 2.54mm [YIMTEX 3362*05SANGR-10]

Table 26 COM5 RS-232 Port 5 Pin Header

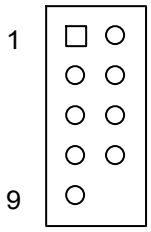


Pin	Signal
1	DCD, Data carrier detect / +12V / +5V *
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator / +12V / +5V *
10	NC, Key

Pitch: 2.54mm [YIMTEX 3362*05SANGR-10]

* : Selected by JP2

Table 27 COM6 RS-232 Port 6 Pin Header

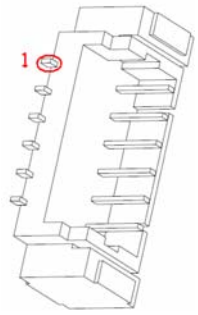


Pin	Signal
1	DCD, Data carrier detect / +12V / +5V *
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator / +12V / +5V *
10	NC, Key

Pitch: 2.54mm [YIMTEX 3362*05SANGR-10]

*：Selected by JP4

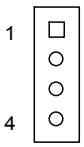
Table 28 CN1 SIM Interface Wafer for MPCIE2



Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND

Pitch: 1.27mm [Pinrex 712-73-06TWB0]

Table 29 CN2 MPCIE Activity Indication Pin Header

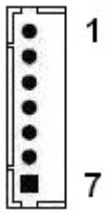


Pin	Signal Name
1	MPCIE1_ACT+
2	MPCIE1_ACT-
3	MPCIE2_ACT+
4	MPCIE2_ACT-

Pitch: 2.54mm [YIMTEX 3321*04SAGR(6T)]

.

Table 30 CN3 Panel Backlight Wafer for LVDS2



Pin	Signal Name
1	NC
2	BL_ADJ *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***

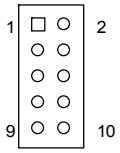
Pitch:1.25mm [Townes Enterprise 1250W-07T1-V]

*：BL_ADJ can be setting from 0V to 5V in BIOS setup.

**：Backlight Power can be selected by JP3.

***：BL_EN can be selected by JP7.

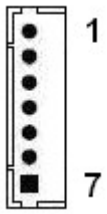
Table 31 CN4 Digital Input / Output Pin Header



Pin	Signal	Pin	Signal
1	Digital Output 0	2	Digital Input 0
3	Digital Output 1	4	Digital Input 1
5	Digital Output 2	6	Digital Input 2
7	Digital Output 3	8	Digital Input 3
9	+5V	10	GND

Pitch: 2.54mm [YIMTEX 3362*05SANGR]

Table 32 CN5 Panel Backlight Wafer for LVDS1



Pin	Signal Name
1	NC
2	BL_ADJ *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***

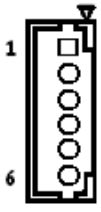
Pitch: 1.25mm [Townes Enterprise 1250W-07T1-V]

*：BL_ADJ can be setting from 0V to 5V in BIOS setup.

**：Backlight Power can be selected by JP5.

***：BL_EN can be selected by JP6

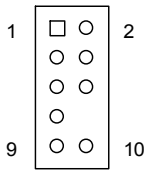
Table 33 CN6 Keyboard & Mouse Wafer



Pin	Signal Name
1	MSCLK
2	VCC
3	MSDAT*
4	KBDAT
5	GND
6	KBCLK

Pitch: 2.0mm [STM M24266]

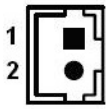
Table 34 CN7 Azalia Front Audio Pin Header



Pin	Signal	Pin	Signal
1	MIC2-L	2	Audio GND
3	MIC2-R	4	Audio GND
5	Line2-R	6	MIC2_JD
7	Audio GND	8	Key
9	Line2-L	10	Line2_JD

Pitch: 2.54mm [YIMTEX 3362*05SANGR-08]

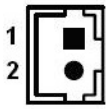
Table 35 CN8 Right Channel 2W Audio AMP Output Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-

Pitch: 2.0mm [YIMTEX 503PW1*02STR]

Table 36 CN9 Left Channel 2W Audio AMP Output Wafer



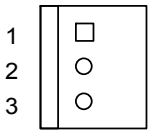
Pin	Signal Name
1	Speaker+
2	Speaker-

Pitch: 2.0mm [YIMTEX 503PW1*02STR]

Table 37 DIMM1 Primary DDR3 Memory SO-DIMM Socket
Height: 9.2mm [ARGOSY DDRSK-20401-TP9D]

Table 38 DIMM2 Secondary DDR3 Memory SO-DIMM Socket
Height: 5.2mm [ARGOSY DDRSK-20401-TP5B]

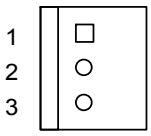
Table 39 FAN1 PU FAN Wafer



Pin	Signal
1	GND
2	+12V*
3	FAN_RPM

Pitch: 2.54mm [YIMTEX 521AW1*03STR]
* : PWM Fan control supported

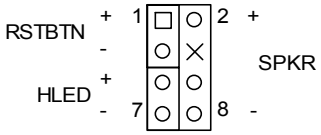
Table 40 System FAN Wafer



Pin	Signal
1	GND
2	+12V*
3	FAN_RPM

Pitch: 2.54mm [YIMTEX 521AW1*03STR]
* : PWM Fan control supported

Table 41 FP1 Front Panel 1 Pin Header

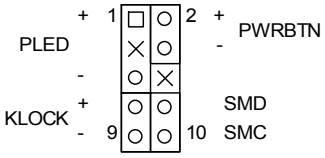


Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -

Pitch: 2.54mm [YIMTEX 3362*04SANGR]

Note：Internal Buzzer is enabled when Pin6-8 is shorted

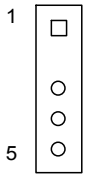
Table 42 FP2 Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	NC
7	Keyboard Lock	8	SMBus Data
9	GND	10	SMBus Clock

Pitch: 2.54mm [YIMTEX 3362*05SANGR]

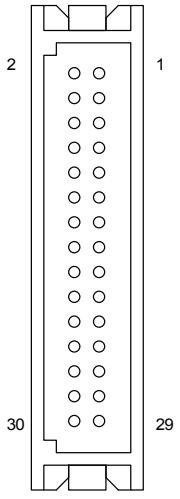
Table 43 IR1 IrDA Pin Header



Pin	Signal Name
1	+5V
2	Key
3	IR_Rx
4	GND
5	IR_Tx

Pitch: 2.54mm [YIMTEX 3321*05SAGR (6T)-02]

Table 44 LVDS1 Primary 24-bit, 2-channel LVDS Panel Connector

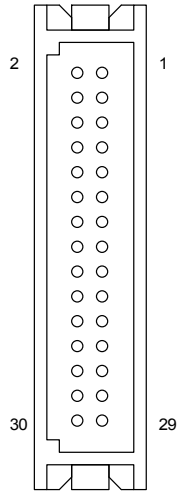


Signal Name	Pin	Pin	Signal Name
GND	2	1	VDD_EN
+3.3V / +5V*	4	3	+3.3V / +5V*
TxclkB-	6	5	TxclkA-
TxclkB+	8	7	TxclkA+
GND	10	9	GND
TxoutB0-	12	11	TxoutA0-
TxoutB0+	14	13	TxoutA0+
TxoutB1-	16	15	TxoutA1-
TxoutB1+	18	17	TxoutA1+
TxoutB2-	20	19	TxoutA2-
TxoutB2+	22	21	TxoutA2+
TxoutB3-	24	23	TxoutA3-
TxoutB3+	26	25	TxoutA3+
GND	28	27	GND
DDC_Clock	30	29	DDC_Data

Pitch: 1.25mm [HIROSE DF13-30DP-1.25(24)]

*：LVDS1 panel power can be selected by JP5

Table 45 LVDS2 Secondary 24-bit, 2-channel LVDS Panel Connector

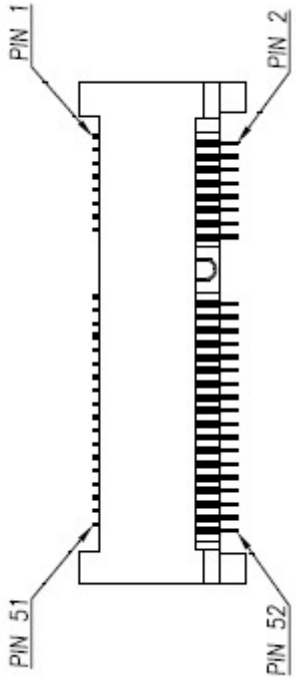


Signal Name	Pin	Pin	Signal Name
GND	2	1	VDD_EN
+3.3V / +5V*	4	3	+3.3V / +5V*
TxclkB-	6	5	TxclkA-
TxclkB+	8	7	TxclkA+
GND	10	9	GND
TxoutB0-	12	11	TxoutA0-
TxoutB0+	14	13	TxoutA0+
TxoutB1-	16	15	TxoutA1-
TxoutB1+	18	17	TxoutA1+
TxoutB2-	20	19	TxoutA2-
TxoutB2+	22	21	TxoutA2+
TxoutB3-	24	23	TxoutA3-
TxoutB3+	26	25	TxoutA3+
GND	28	27	GND
DDC_Clock	30	29	DDC_Data

Pitch: 1.25mm [HIROSE DF13-30DP-1.25(24)]

*：LVDS2 panel power can be selected by JP3.

Table 46 PCIE1 Mini-PCIE Express v1.2 Socket 1

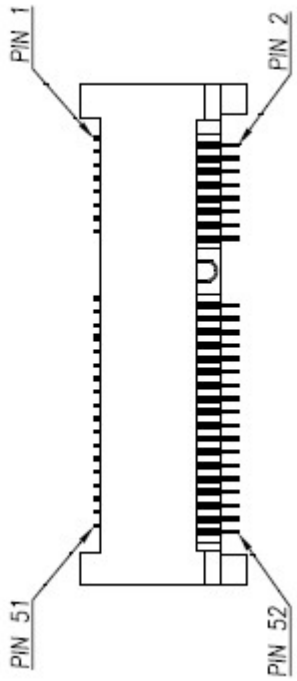


Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	Reserved
Ground	9	10	Reserved
REFCLK-	11	12	Reserved
REFCLK+	13	14	Reserved
Ground	15	16	Reserved
LPC_CLK*	17	18	Ground
LPC_FRAME#*	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
LPC_AD0*	45	46	LED_WPAN#
LPC_AD1*	47	48	+1.5V
LPC_AD2*	49	50	Ground
LPC_AD3*	51	52	+3.3VSB

Height: 9.0mm [ARGOSY MPCEC-S00F1-TP09]

*：Internal debug only, left these pins open

Table 47 PCIE2 Mini-PCIE Express v1.2 Socket 2

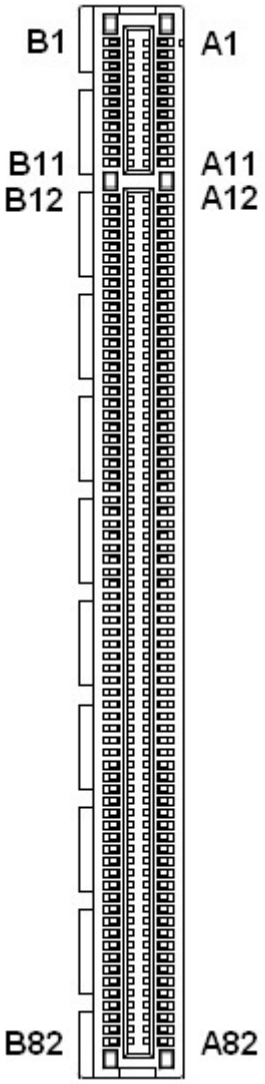


Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

Height: 5.5mm [ARGOSY MPCEC-S00F1-TP03]

*：These pins are connected to CN1 directly.

Table 48 PEG1 PCIE Express x 16 Slot



Pin	Side B	Side A
1	+12V	PRSNT1#
2	+12V	+12V
3	Reserved	+12V
4	Ground	Ground
5	SMCLK	Reserved
6	SMDAT	Reserved
7	Ground	Reserved
8	+3.3V	Reserved
9	Reserved	+3.3V
10	+3.3VSB	+3.3V
11	WAKE#	PERST#
12	Reserved	Ground
13	Ground	REFCLK+
14	HSOP0	REFCLK-
15	HSON0	Ground
16	Ground	HSIP0
17	PRSNT2#	HSIN0
18	Ground	Ground
19	HSOP1	Reserved
20	HSON1	Ground
21	Ground	HSIP1
22	Ground	HSIN1
23	HSOP2	Ground
24	HSON2	Ground
25	Ground	HSIP2
26	Ground	HSIN2
27	HSOP3	Ground
28	HSON3	Ground
29	Ground	HSIP3
30	Reserved	HSIN3
31	PRSNT2#	Ground
32	Ground	Reserved
33	HSOP4	Reserved
34	HSON4	Ground
35	Ground	HSIP4
36	Ground	HSIN4
37	HSOP5	Ground
38	HSON5	Ground
39	Ground	HSIP5
40	Ground	HSIN5
41	HSOP6	Ground
42	HSON6	Ground
43	Ground	HSIP6
44	Ground	HSIN6
45	HSOP7	Ground
46	HSON7	Ground
47	Ground	HSIP7
48	PRSNT2#	HSIN7
49	Ground	Ground
50	HSOP8	Reserved
51	HSON8	Ground
52	Ground	HSIP8
53	Ground	HSIN8
54	HSOP9	Ground

Pin	Side B	Side A
55	HSON9	Ground
56	Ground	HSIP9
57	Ground	HSIN9
58	HSOP10	Ground
59	HSON10	Ground
60	Ground	HSIP10
61	Ground	HSIN10
62	HSOP11	Ground
63	HSON11	Ground
64	Ground	HSIP11
65	Ground	HSIN11
66	HSOP12	Ground
67	HSON12	Ground
68	Ground	HSIP12
69	Ground	HSIN12
70	HSOP13	Ground
71	HSON13	Ground
72	Ground	HSIP13
73	Ground	HSIN13
74	HSOP14	Ground
75	HSON14	Ground
76	Ground	HSIP14
77	Ground	HSIN14
78	HSOP15	Ground
79	HSON15	Ground
80	Ground	HSIP15
81	PRSNT2#	HSIN15
82	Reserved	Ground

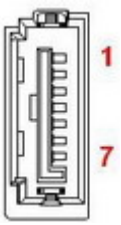
Pitch: 1.0mm [WIN WIN WPCS-164AN41B22UWL]

Table 49 SATA1 Serial ATA Port0 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

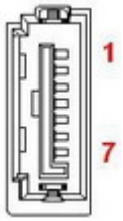
Table 50 SATA2 Serial ATA Port1 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

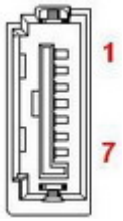
Table 51 SATA3 Serial ATA Port2 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

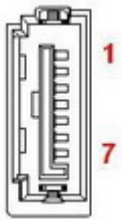
Table 52 SATA4 Serial ATA Port3 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

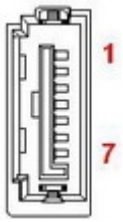
Table 53 SATA5 Serial ATA Port4 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

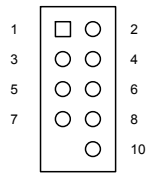
Table 54 SATA6 Serial ATA Port5 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

[FOXCONN LD1807V-S52U]

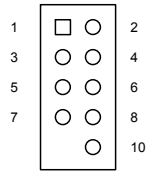
Table 55 USB1 USB2.0 Port 4, 5 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

Pitch: 2.54mm [YIMTEX 3362*05SANGR-09]

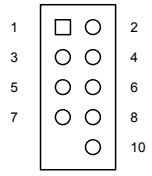
Table 56 USB2 USB2.0 Port 6, 7 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

Pitch: 2.54mm [YIMTEX 3362*05SANGR-09]

Table 57 USB3 USB2.0 Port 8, 9 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

Pitch: 2.54mm [YIMTEX 3362*05SANGR-09]

Chapter 3

System Installation

■ Expansive Interfaces

mini PCIe x1 slot

CF

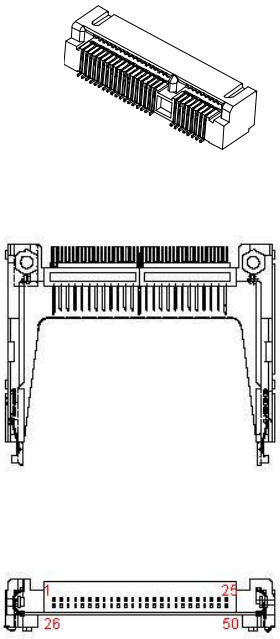


Figure 6 Expansive Interfaces

NOTE

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

■ Memory Module Installation

Carefully follow the steps below in order to install the SO-DIMMs:

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.
3. To make sure the correct DDR3 SO-DIMM notches should match with the DDR3 SO-DIMM.
4. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it into the socket.
5. Fully insert the module into the socket.

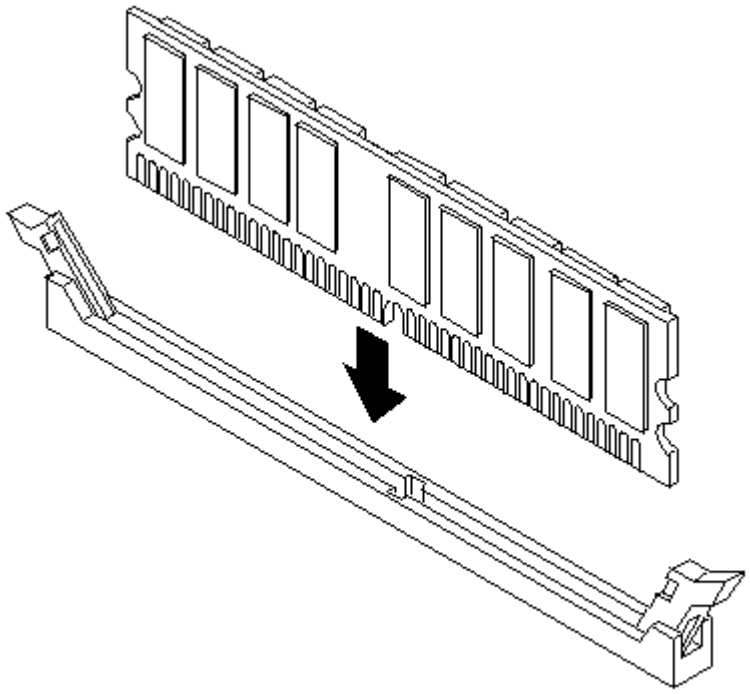


Figure 7 Press down on the SO-DIMM Memory Module to lock it in place

Removing a SO-DIMM:

To remove the SO-DIMM, press down both sides of the holders carefully and lift it out of the socket.

Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

Chapter 4

AMI BIOS Setup

■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.

NOTE: The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the "<" and ">" cursor keys to navigate between menu screens.

Table 58 BIOS Main Menu

BIOS SETUP UTILITY					
Main	Advanced	Boot	Security	Save & Exit	
BOS Information					
Version		0.03			Set the Date. Use Tab to switch between Data elements.
Build Date		03/16/2011			
CPU Information					→←: Select Screen
Intel ® Core ™ i7-2630QM CPU @ 2.00 GHz					↑↓: Select Item
Microcode Revision		12			Enter: Select
Processor Cores		4			+/-: Change Opt.
					F1: General Help
Memory Information					F2: Previous Values
Total Size		4096 MB (DDR3)			F3: Optimized Defaults
Frequency		1333 MHz			F4: Save and Exit
					ESC: Exit
System Date		[Tue 03/22/2011]			
System Time		[11:38:22]			
Version 2.10.1208. Copyright © 2010 American Megatrends, Inc.					

■ Advanced Menu

Table 59 Advanced Menu

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
Full Item for Debug		[Disabled]			
Onboard LAN1 Controller		[Enabled]			
Onboard LAN1 Boot		[Disabled]			
Onboard LAN2 Controller		[Enabled]			
Onboard LAN2 Boot		[Disabled]			
Audio Controller		[Enabled]			→←: Select Screen
					↑↓: Select Item
➢ Display Configuration					Enter: Select
➢ Super IO Configuration					+/-: Change Opt.
➢ Power Management Configuration					F1: General Help
➢ SATA Configuration					F2: Previous Values
➢ AMT Configuration					F3: Optimized Defaults
➢ USB Configuration					F4: Save and Exit
➢ H/W Monitor					ESC: Exit
➢ CPU Advanced Configuration					
Version 2.10.1208. Copyright © 2010 American Megatrends, Inc.					

Table 60 Advanced Menu – Display Configuration

BIOS SETUP UTILITY		
Advanced		
Display Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display or select SG for Switchable Gfx.
Primary Display	[AUTO]	
Internal Graphics	[AUTO]	
Aperture Size	[256MB]	
DVMT Pre-Allocated	[64M]	
DVMT Total Gfx Mem	[256M]	
IGFX – Boot Type	[VBIOS Default]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Active LVDS	[No LVDS]	
LVDS1 Panel Type	[VBIOS Default]	
LVDS2 panel Type	[VBIOS Default]	
LVDS1 Panel Backlight Voltage	[2.5 V]	
LVDS2 Panel backlight Voltage	[2.5 V]	
Version 2.10.1208. Copyright © 2010 American Megatrends, Inc.		

Primary Display

Options: Auto, IGFX, PEG, PCI, SG

Internal Graphics

Options: Auto, Disabled, Enabled

Aperture Size

Options: 128MB, 256MB, 512MB

DVMT Pre-Allocated

Options: 0M, 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M

DVMT Total Gxf Mem

Options: 128M, 256M, MAX

IGFX – Boot Type

Options: VBIOS Default, CRT, DVI, HDMI

Active LVDS

Options: No LVDS, LVDS1, LVDS2

LVDS1 Panel Type

Options: VBIOS Default, 1024x768 18bit 1Ch, 1280x1024 24bit 2Ch, 1366x768 24bit 2Ch, 1920x1080 24bit 2Ch

LVDS2 Panel Type

Options: VBIOS Default, 1024x768 18bit 1Ch, 1280x1024 24bit 2Ch, 1400x1050 24bit 2Ch, 1600x1200 24bit 2Ch

LVDS1 Panel Backlight Voltage

Options: 0.0V, 0.5V, 1.0V, 1.5V, 2.0V, 2.5V, 3.0V, 3.5V, 4.0V, 4.5V, 5.0V

LVDS2 Panel Backlight Voltage

Options: 0.0V, 0.5V, 1.0V, 1.5V, 2.0V, 2.5V, 3.0V, 3.5V, 4.0V, 4.5V, 5.0V

Table 61 Advanced Menu – Super IO Configuration

BIOS SETUP UTILITY	
Advanced	
Super IO Configuration ➢ Serial Port 1 Configuration ➢ Serial Port 2 Configuration ➢ Serial Port 3 Configuration ➢ Serial Port 4 Configuration ➢ Serial Port 5 Configuration ➢ Serial Port 6 Configuration	Set parameters of Serial Port 1 (COM1) →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Table 62 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port Device Settings	[Enabled] IO=3F8h ; IRQ=4;	
Change Settings Serial Port 1 Type	[Auto] [RS232]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Serial Port 1 Type

Options: RS232, 422, 485

Table 63 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h ; IRQ=3;	
Change Settings	[Auto]	→←: Select Screen
Device Mode	[Standard Serial Po...]	↑↓: Select Item
Serial Port 2 Type	[RS232]	Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save and Exit
		ESC: Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2F8h; IRQ=3; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Device Mode

Options: Standard Serial Port Mode; IrDA function, active pulse is 1.6uS.; IrDA function, active pulse is 3/16 bit time.

Serial Port 2 Type

Options: RS232, 422, 485

Table 64 Advanced Menu – Super IO Configuration – Serial Port 3 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 3 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3E8h ; IRQ=7;	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Change Settings	[Auto]	
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2E8h; IRQ=7; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 65 Advanced Menu – Super IO Configuration – Serial Port 4 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 4 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2E8h ; IRQ=10;	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Change Settings	[Auto]	
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2E0h; IRQ=10; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 66 Advanced Menu – Super IO Configuration – Serial Port 5 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 5 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F0h ; IRQ=11;	
Change Settings	[Auto]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2F0h; IRQ=10; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 67 Advanced Menu – Super IO Configuration – Serial Port 6 Configuration

BIOS SETUP UTILITY		
Advanced		
Serial Port 6 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2E0h ; IRQ=10;	
Change Settings	[Auto]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto, IO=2E8h; IRQ=3; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h;

IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Table 68 Advanced Menu – Power Management Configuration

BIOS SETUP UTILITY		
Advanced		
Power Management Configuration		Select the highest ACPI Sleep State the System will enter, when the SUSPEND button is pressed. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
ACPI Sleep State	[S3 (Suspend to RAM)]	
Restore AC Power Loss	[Power Off]	
Resume From S3 By PS/2 Keyboard	[Disabled]	
Resume From S3 By PS/2 Mouse	[Disabled]	
Resume By PCIE Device	[Disabled]	
Resume From S3 By USB Device	[Disabled]	
Resume By RTC Alarm	[Disabled]	
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ACPI Sleep State

Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM)

Restore AC Power Loss

Options: Power Off, Power On, Last State

Resume From S3 By PS/2 Keyboard

Options: Disabled, Enabled

Resume From S3 By PS/2 Mouse

Options: Disabled, Enabled

Resume By PCIE Device

Options: Disabled, Enabled

Resume From S3 By USB Device

Options: Disabled, Enabled

Resume By RTC Alarm

Options: Disabled, Enabled

Table 69 Advanced Menu – SATA Configuration

BIOS SETUP UTILITY		
Advanced		
SATA Controller(s)	[Enabled]	Enable or Disable SATA Device.
SATA Mode Selection	[IDE]	
Serial ATA Port 0	FIJITSU MH2216 (160.0	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Software Preserve	SUPPORTED	
Serial ATA Port 1	Empty	
Software Preserve	Unknown	
Serial ATA Port 2	Empty	
Software Preserve	Unknown	
Serial ATA Port 3	Empty	
Software Preserve	Unknown	
Serial ATA Port 4	Empty	
Software Preserve	Unknown	
Serial ATA Port 5	Empty	
Software Preserve	Unknown	
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SATA Controller(s)

Options: Enabled, Disabled

SATA Mode Selection

Options: IDE, AHCI, RAID

Table 70 Advanced Menu – AMT Configuration

BIOS SETUP UTILITY		
Advanced		
Intel AMT	[Enabled]	Enable/Disable Intel ® Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional Firmware in the SPI device →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Intel AMT Setup Prompt	[Enabled]	
BIOS Hotkey Pressed	[Disabled]	
MEBx Selection Screen	[Disabled]	
Verbose Mebx Output	[Enabled]	
Hide Un-Configure ME Confirmation	[Disabled]	
MEBx Debug Message Output	[Disabled]	
Un-Configure ME	[Disabled]	
Intel AMT Password Write Enabled	[Enabled]	
Amt Wait Timer	0	
ASF	[Enabled]	
Activate remote Assistance Process	[Disabled]	
USB Configure	[Enabled]	
PET Progress	[Enabled]	
Intel AMT SPI Protected	[Disabled]	
AMT CIRA Timeout	0	
WatchDog	[Disabled]	
OS Timer	0	
BIOS Timer	0	
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Intel AMT

Options: Disabled, Enabled

Intel AMT Setup Prompt

Options: Disabled, Enabled

BIOS Hotkey Pressed

Options: Disabled, Enabled

MEBx Selection Screen

Options: Disabled, Enabled

Verbose Mebx Output

Options: Disabled, Enabled

Hide Un-Configure ME Confirmation Prompt

Options: Disabled, Enabled

MEBx Debug Message Output

Options: Disabled, Enabled

Un-Configure ME

Options: Disabled, Enabled

Intel AMT Password Write Enabled

Options: Disabled, Enabled

Amt Wait Timer

Options: 0

ASF

Options: Disabled, Enabled

Activate Remote Assistance Process

Options: Disabled, Enabled

USB Configure

Options: Disabled, Enabled

PET Progress

Options: Disabled, Enabled

Intel AMT SPI Protected

Options: Disabled, Enabled

WatchDog

Options: Disabled, Enabled

Table 71 Advanced Menu – USB Configuration

BIOS SETUP UTILITY	
Advanced	
USB Configuration	Enables legacy USB support.
USB Devices : 1 Keyboard, 2 Mice, 2 Hubs	AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
Legacy USB Support [Enabled] USB 3.0 Support [Enabled] XHCI Hand-off [Enabled] EHCI Hand-off [Disabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
USB hardware delays and time-outs : USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto]	
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Legacy USB Support

Options: Enabled, Disabled, Auto

USB 3.0 Support

Options: Enabled, Disabled

XHCI Hand-off

Options: Enabled, Disabled

EHCI Hand-off

Options: Enabled, Disabled

USB transfer time-out

Options: 1 sec, 5 sec, 10 sec, 20 sec

Device reset time-out

Options: 10 sec, 20 sec, 30 sec, 40 sec

Device power-up delay

Options: Auto, Manual

Table 72 Advanced Menu – H/W Monitor

BIOS SETUP UTILITY	
Advanced	
PC Health Status	
CPU Warning Temperature [Disabled]	
CPU Shutdown Temperature [Disabled]	
CPU temperature : +8 C	
System temperature2 : +40 C	
System temperature3 : +40 C	
Fan1 Speed : 5016 PM	→←: Select Screen
Fan2 Speed : N/A	↑↓: Select Item
	Enter: Select
+3.3V : +3.296 V	+/-: Change Opt.
+VCORE : +0.960 V	F1: General Help
+VGFX : +0.440 V	F2: Previous Values
+1.05V : +2.096 V	F3: Optimized Defaults
+1.5V : +1.032 V	F4: Save and Exit
+5VDUAL : +1.024 V	ESC: Exit
+12V : +1.096 V	
+3.3VSB : +1.640 V	
+VCCRTC : +1.624 V	
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CPU Warning Temperature

Options: Disabled, 80C, 85C, 90C, 95C

CPU Shutdown Temperature

Options: Disabled, 80C, 85C, 90C, 95C

Table 73 Advanced Menu – CPU Advanced Configuration

BIOS SETUP UTILITY	
Advanced	
CPU Advanced Configuration	Enable/Disable Intel SpeedStep
EIST [Enabled]	
Turbo Mode [Enabled]	
Intel (R) Virtualization Tech [Disabled]	
Intel (R) Hyper Threading Tech [Disabled]	
Active Processor Cores [All]	→←: Select Screen
Limit CPUID Maximum [Disabled]	↑↓: Select Item
Execute Disable Bit [Enabled]	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save and Exit
	ESC: Exit
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EIST

Options: Disabled, Enabled

EIST

Options: Disabled, Enabled

Turbo Mode

Options: Disabled, Enabled

Intel ® Virtualization Tech

Options: Disabled, Enabled

Intel ® Hyper Threading Tech

Options: Disabled, Enabled

Active Processor Cores

Options: All, 1, 2, 3

Limit CPUID

Options: Disabled, Enabled

Execute Disable Bit

Options: Disabled, Enabled

■ Boot Menu

Table 74 Boot Menu

BIOS SETUP UTILITY				
Main	Advanced	**Boot**	Security	Save & Exit
Boot Configuration				Enables or disables Quiet Boot option
Full Screen LOGO Display		[Disabled]		
Setup Prompt timeout		1		
Bootup NumLock		[On]		
Boot Option Priorities				
Boot Option #1		[SATA: FUJITSU MHZ2…]		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
Hard Drive BBS Priorities				
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Full Screen LOGO Display

Options: Disabled, Enabled

Setup Prompt Timeout

Options: 1

Bootup Numlock State

Options: On, Off

Boot Option #1

Options: SATA: FUJITSU MHZ2160BH G2, Disabled

Hard Drive BBS Priorities → Boot Option #1

Options: SATA: FUJITSU MHZ2160BH G2, Disabled

■ Security Menu

Table 75 Security Menu

BIOS SETUP UTILITY	
Main Advanced Boot **Security** Save & Exit	
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights Administrator Password User Password HDD Security Configuration: HDD O: FUJITSU MHZ2	Set Setup Administrator Password →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

Change User Password

Select this item to set or change the user password. The User Password item on top of the screen displays the default Not Installed. After you have set a password, this item displays Installed.

■ Save & Exit Menu

Table 76 Save & Exit Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	**Save & Exit**
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults Save as User Defaults Restore User Defaults Boot Override SATA: FIJITSU MHZ2160BH G2				Exit System Setup after saving the changes. →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for

this operation.

Load Failsafe Defaults

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

Chapter 5

Driver Installation

If your KEMX-6000 does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system.
You can download the drivers for the KEMX-6000 from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

NOTE

When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing **<Ctrl>+<Alt>+<F1>** simultaneously to show the image on screen.

Appendix A

DIO (Digital I/O) Sample Code

```
//****************************************************************
//KEMX-6000 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//0:Low 1:High
//DI_1: IOport 0x50C bit2   DO_1: IOport 0x539 bit4
//DI_2: IOport 0x50C bit3   DO_2: IOport 0x539 bit5
//DI_3: IOport 0x50C bit4   DO_3: IOport 0x539 bit6
//DI_4: IOport 0x50C bit5   DO_4: IOport 0x53B bit0
//****************************************************************

int main()
{
      int RetVal;

      //Clear DO_1~4
      RetVal=inp(0x539);//IO Port: 0x539
      RetVal=(RetVal&0x8F);//DO_1 is bit 4
                           //DO_2 is bit 5
                           //DO_3 is bit 6
      outp(0x539,RetVal);

      RetVal=inp(0x53B);//IO Port: 0x53B
      RetVal=(RetVal&0xFE);//DO_4 is bit 0
      outp(0x53B,RetVal);

      system("pause");

      //Setting DO_1~4
      RetVal=inp(0x539);//IO Port: 0x539
      RetVal=(RetVal|0x70);//DO_1 is bit 4
                           //DO_2 is bit 5
                           //DO_3 is bit 6
      outp(0x539,RetVal);

      RetVal=inp(0x53B);//IO Port: 0x53B
      RetVal=(RetVal|0x01);//DO_4 is bit 0
      outp(0x53B,RetVal);

      system("pause");
```

```
	//Reading DI_1~4
	RetVal=inp(0x50C);//IO Port: 0x50C
	RetVal=(RetVal&0x3C);//DI_1 is bit 2
			//DI_2 is bit 3
			//DI_3 is bit 4
			//DI_4 is bit 5
	printf("DI_= %d\n",RetVal);
	system("pause");

	return 0;
}
```

Appendix B

WatchDog Timer Sample Code

```
//===========================================
//KEMX-6000 DOS Watchdog sample program
//Please compile with Turbo C 3.0 to utilized the program
//===========================================

#include<stdio.h>
int main()
{
  int value;
//Initialized the WDT program
  outp(0x2E,0x87);
  outp(0x2E,0x87);

//Setting Logical Device Number to 0x07
  outp(0x2E,0x07);
  outp(0x2F,0x07);

//0xF5 bit6
//If watchdog timeout event occurs, this bit will be set to 1.
//Write a 1 to this bit will clear it to 0.
  outp(0x2F,0xF5);
  value=inp(0x2F);
  outp(0x2F,(value | 0x40));

//Set Timer unit
//(0xF5 bit3(0: 1sec, 1: 60 sec) of watchdog timer by setting this bit)
  outp(0x2E,0xF5);
  value=inp(0x2F);
  outp(0x2F,(value & 0xF7));//set unit sec.

//Set Timer Value(0xF6 Time of watchdog timer)
  outp(0x2E,0xF6);
  outp(0x2F,0x14);//set to 20 sec (0x14)

//Enable WDT
  outp(0x2E,0xF5);
  value=inp(0x2F);
```

```
  outp(0x2F,(value | 0x30));//

  outp(0x2E,0xF0);
  outp(0x2F,0x81);//bit7 WDTRST# output is enabled

  return 0;
}
```